DOCUMENT RESUME

ED 302 806 CS 009 427

AUTHOR Stahl, Steven A.
TITLE Prior Knowledge and Task Variations in Learning Word Meanings from Context.
PUB DATE 88
NOTE 18p.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Cloze Procedure; Content Area Reading; *Context Clues; Grade 6; Intermediate Grades; *Prior Learning; Reading Ability; *Reading Comprehension; Reading Research; Vocabulary Skills
IDENTIFIERS Context Effect; Text Factors

ABSTRACT

To examine the effects of general and specific comprehension ability of a target reading passage and prior knowledge of the subject of the passage, a study examined 182 sixth graders from two central Illinois rural and urban communities. Subjects were given a fifth-grade passage (a 500-word fictional narrative description of the Yanomamo tribe of the Amazonian Basin) from the "De Santi Cloze Reading Inventory." Subjects were given either the original passage, or a difficult version created by substituting a difficult synonym (about eighth-grade level) for every sixth content word. Cloze condition students were given the passage in a conventional cloze format. Other students were given an intact version of the passage. Students were first given a cloze passage from the "De Santi Cloze Reading Inventory" to equate ability level. Before reading, students were told either key facts about the Yanomano villagers, or facts which were tangential to the narrative. Following the presentation students read the passage. In the cloze condition, students filled in the cloze blanks with a word which made sense in the passage. In both conditions, the passage was taken away after reading and subjects were given a multiple choice test assessing the knowledge of 10 of the substituted words. Results confirmed earlier studies indicating that children learn word meanings from context, but did not find effects on the rate of that learning due to task manipulations, prior knowledge, and general or specific comprehension. (One figure, the multiple choice test, and 22 references are appended.) (MM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED302806

Prior Knowledge and Task Variations in Learning Word Meanings from Context

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Steven Stahl

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Steven A. Stahl

Western Illinois University

Department of Elementary Education and Reading

Macomb, IL 61455

Running Head: Learning from Context

CS009427

Prior Knowledge and Task Variations in Learning Word Meanings from Context

Children learn most of their productive meaning vocabulary from exposure to words in context. Nagy and Anderson (1984) estimated that, on the average, children acquire a vocabulary of roughly 45,000 words over the school years. If we estimate that the average child learns about 6000 words prior to entering school, this breaks down to about 3000 words that need to be learned every year. In fact, studies do indicate that this is approximately the number of new word meanings children acquire during the school years (Graves & Slater, 1987).

There are two other facts about the 3000 word figure. First, there are significant variations in the number of words children acquire. Graves and Slater (1987) estimate that this can vary between 1000 and 5000 words, a significant variation. Therefore, there are tremendous differences in the numbers of words known by students with good and poor vocabularies. These differences are bound to make a significant difference in their reading (Stanovich, 1986). Second, although direct instruction of vocabulary seems to significantly improve comprehension (Stahl & Fairbanks, 1986), it is impossible to directly teach as many words as average readers acquire on their own. Estimates are that one can profitably teach between 200-300 and possibly as high as 800 words per year (Nagy & Anderson, 1984).

A number of studies of children's ability to learn from context have found that students can acquire the requisite number of words from context, given the number of words they read per year, the number of previously unknown words they encounter, and the rate of incidental

learning of those words from context. Nagy, Herman, and Anderson (1985) found that students can learn 15-20% of the unknown words in a text well enough to answer multiple choice questions given 15 minutes after reading. Nagy, Anderson, and Herman (1987) found the rate of incidental learning from context dropped to about 5% when the test was given six days after reading the text. This latter figure is a better estimate of the long-term effects of reading unknown words in context. It is not unreasonable to assume that an average fifth grader reads about 1,200,000 words per year (Anderson, Wilson, & Fielding, 1988), of which roughly 60,000 are unfamiliar (5% of the 1,200,000), a 5% learning rate would account for the 3000 words per year that Graves and Slater (1987) estimate that they actually do learn.

Conditions that Affect Learning from Context

The tetrahedral model described by Brown, Campione, and Day (1981) suggests that successful learning involves the interaction of learner factors, text factors, task factors, and how learning was assessed. Sternberg (1987) similarly suggests that learning from context involves the interplay of three factors -- the learner's processes of knowledge acquisition, contextual cues available in the text, and moderating variables, such as the number of difficult words and the number of repetitions of the unknown word.

Learner Factors. Of the possible learner factors, a number of studies have examined the effects of student ability on learning from context. When the task was deriving the meanings of unknown words, or when students were asked directly to infer the meanings of unknown words, clear ability differences were found (e.g. Elshout-Mohr & van Daalen-Kapteijns, 1987; McKeown, 1985). When the task was learning word meanings incidentally, or

when students read for a different purpose but were given a surprise vocabulary test, such differences were not always found. Jenkins, Stein, and Wysocki (1984) and Herman et al. (1987) found significant ability differences, while Nagy, Herman, and Anderson (1985) and Nagy, Anderson, and Herman (1987) did not.

Aside from general ability, Sternberg (1987) also suggests that specific comprehension might affect word learning. He argues that vocabulary learning is a result of learning from text, rather than a cause. He suggests that comprehension involves getting a rough idea of the meanings of unknown words. Thus, the more able one is to comprehend text, the more words one will learn from context, regardless of their general ability.

Text Factors. Nagy, Anderson, and Herman (1987) found that the percentage of conceptually difficult words, defined as words which could not be defined outside of a related system of concepts, significantly affected learning from context, as did the length of the target words in syllables and a rating of the amount of contextual support given. Nagy et al. tested a number of other factors which did not appear to affect learning from context. Among these were part of speech and morphological transparency. Text genre and readability affected learning from context in complex interactions with other factors.

Task Factors. Only one task factor has been examined in the learning from context literature, to my knowledge. Konopak et al. (1987) found that children learned more when directed to derive word meanings than in an incidental learning condition, where they were not given specific directions.

Our research (Stahl, Jacobson, Davis, & Davis, 1989) suggests that vocabulary difficulty affects readers' microprocessing, or the understanding of individual sentences and the relations between them. If so, having children do a comprehension task which relies on microprocessing would force children to direct their attention toward unknown words and might affect learning from context more than a task which requires more general processing. In our other studies, children given difficult vocabulary versions recalled significantly fewer propositions in the order they occurred in the text and were significantly less able to recognize the order of significant events in the narrative. They also were significantly poorer at exact replacement of function words in a cloze activity. In this study, the microprocessing task was a conventional cloze task, one which Kintsch and Yarbrough (1982) found to be sensitive to microprocessing.

In addition to examining the effects of different orienting tasks, this study was designed to examine the effects of several learner factors — general comprehension ability and specific comprehension of the target passage, and prior knowledge of the subject of the passage.

Method

Subjects

Subjects were 182 sixth graders who participated in a two of a series of studies (Stahl, et al., 1989, Exp. 2 and 3). They attended eight classes located in two central Illinois communities. Eighty three subjects lived in a rural, farming community; the remainder lived in a community adjacent to a small city. They were of diverse socieconomic status and all were Caucasian. All subjects were given a fifth grade passage from the De Santi Cloze Reading Inventory (De Santi, 1986). This measure was used because we wished to account for general ability to deal with cloze activities and

because it presented acceptable concurrent validity with a standardized achievement test. There were no significant differences found between any of the groups on this measure.

Materials

These studies all used the same passage, a 500 word fictional narrative description of the activities of a native tribe living in the Amazonian basin, the Yanomamos. Subjects were either given the original passage, as taken from a social studies textbook (Owen, 1972), or a difficult version created by substituting a difficult synonym for every sixth content word. Difficult synonyms were defined as words rated about the eighth grade level in the Dale and O'Rourke (1976) compendium. Copies of the passage can be found in Stahl and Jacobson (1986). Students in the cloze condition were given one version of the passage in a conventional cloze format, with the first and last sentences intact and every fifth word replaced by a standard size blank, except if the fifth word was a substituted word. Then the blank was placed either before or after the difficult word, alternating before and after. Students in the normal reading version were given an intact version of the passage.

The dependent variable was a multiple choice test assessing the knowledge of ten of the substituted words. Three of the words were taken from the beginning of the passage, four from the middle, and three from the end. Words were chosen randomly, with the provision that they could be defined succinctly by a synonym. Therefore, all words were of intermediate conceptual complexity, using the criteria of Nagy, Anderson, and Herman (1987). On the test, there were four choices for each target word, a synonym chosen from the dictionary, a word of the same part of speech and

from the same semantic field, and two other words of the same part of speech. (A copy of the test is appended.)

Procedures

Students were first given a cloze passage from the De Santi Cloze Reading Inventory (De Santi, 1986), according to test directions. This was used to equate students by ability.

Before reading, students were either told key facts about the Yanomamos, that they were extremely violent and distrustful of people not in their immediate village, or facts which were tangential to the narrative, that the Yanomamo were polygamous. An analysis of the passage indicates that information about the violence and distrust underlies the central information in the text, while information about polygamy relates only to a single low level detail. The lessons were given to classes of sixth graders by an experienced social studies teacher. My observation was that the students appeared highly interested and engaged during these lessons. In the normal reading condition, 92 of the 99 subjects rated themselves as either "Interested" or "Very Interested" in the presentation.

Following the presentation, students read the passage. In the cloze condition, they were instructed to fill in the cloze blanks with a word which made sense in the passage. In the normal reading condition, they were told they would be asked about the passage. In both conditions, the passage was taken away after reading and subjects were immediately given the multiple choice test. This was given first in order to avoid reaction with the other comprehension activities given after reading (see Stahl et al., 1989).

Analysis

Students were in one of eight possible conditions, defined by a 2

(Vocabulary Difficulty) by 2 (Relevant, Irrelevant Preteaching) by 2 (Cloze, Normal Reading Condition) design matrix. At least 15 students were in each condition. Learning from context effects were tested through the interactions of Vocabulary Difficulty with the other factors. Thus, learning from context was measured by comparing those students who saw the difficult vocabulary with those who read a passage not containing the tested words. An Analysis of Covariance, with the De Santi cloze score as the co-variate was used to test the effects of these factors. The effects of the students' general ability and specific comprehension of the passage on learning from context were tested in secondary analyses.

Results

In the ANCOVA, only the effects for the covariate and the main effect for vocabulary difficulty were statistically significant ($F(1,175)=4.41$, $p<.01$). Children in the difficult vocabulary condition answered an average of 7/10 of a question better than children in the easy vocabulary condition. This suggests that children learned about 7% of the words from one reading in context. Although children in the cloze condition learned slightly more words from context than those in the normal reading condition the hypothesized interaction between vocabulary difficulty and Condition did not approach statistical significance. (See Figure 1).

Nor did the effects due to preteaching. In this study, children receiving relevant preteaching learned no more words than those receiving irrelevant preteaching. The preteaching did, however, affect children's comprehension in the normal reading condition (See Stahl et al., 1989). It was not expected to significantly affect cloze comprehension and it did not.

General ability did significantly affect performance on the multiple choice test, but did not significantly interact with vocabulary difficulty. Students wil higher general ability knew more words, but, in this study, as in Nagy et al.'s two studies (1985, 1987) students with higher ability were not significantly better at inferring word meanings from context in an incidental learning task.

To examine Sternberg's (1987) suggestion that the amount of learning from context might relate to a person's comprehension of the passage, I calculated a partial correlation between the total cloze score and the learning from context measure in both the easy and the different vocabulary conditions, partialling out the effects of the cloze inventory score. (The only global comprehension measure available was the cloze task, so only the 83 subjects in that condition were included). If greater comprehension was related to greater learning from context, then the correlation between the child's cloze score and the learning from context measure should be higher for the difficult vocabulary sample than for the easy vocabulary sample. In fact, for the easy vocabulary group, the correlation was 0.25 ($p<.07$), while that for the difficult vocabulary condition was 0.18 (which did not approach significance). These are lower than expected from Sternberg's hypothesis.

Separate correlations between the number of function and content words correctly replaced were equally inconclusive. The partial correlations between the number of function words replaced was 0.12 for the easy group and .08 for the difficult group. For the number of content words replaced, in the easy condition, the correlation was 0.27, in the difficult group, the correlation was 0.25.

Discussion

The results of this study confirm earlier studies indicating that children learn word meanings from context, but did not find effects on the rate of that learning due to task manipulation, prior knowledge, general or specific comprehension. The 7% learning from context rate is lower than that found in the Nagy, Herman, and Anderson (1985) study, which most closely approximated the conditions in the present study. The differences are probably due to differences in how word meanings were measured. They used a structured interview to measure word knowledge, as opposed to a fairly difficult multiple choice test.

Especially interesting is the finding that subjects inferred word meanings from context at approximately the same rate when performing a cloze replacement task as they did during normal reading. Presumably, a cloze task involves a different type of text processing than conventional reading for comprehension. Yet, in spite of these differences, subjects' learning from context was not impaired, nor was it enhanced.

The lack of effects due to prior knowledge are difficult to interpret. One cannot say that prior knowledge did not make a difference in learning from context, since our preteaching may be a weak surrogate for the concept of prior knowledge. However, the preteaching used here did significantly affect overall text comprehension in the Stahl, et al. (1989, exp. 1) study.

The failure to find effects on learning from context due to either general or specific comprehension skill is equally difficult to interpret. Three studies, Nagy et al. (1985, 1987) and the present study failed to find significant effects for general comprehension on an incidental learning task, while two others, Jenkins et al. (1984) and Herman et al.

(1987) did.

If, as found here, high ability students are no better at inferring word meanings than low ability students, then the differences in vocabulary size found by Graves and Slater (1987) may be due to differences in the amount of reading volume, rather than differences in ability per se. Anderson, Wilson, and Fielding (1988) found very large differences in the amount of text high and low ability children read annually, differences large enough to affect their vocabulary acquisition and consequently their overall reading ability. This argument that the "rich get richer" was made forcefully by Stanovich (1986). This suggests that, to increase children's vocabulary size and consequently their comprehension skill, efforts should be made to motivate poorer readers to read more connected text. Some studies have found that the amount of silent reading of connected text significantly improves reading skill, while others do not (Wilkinson, Anderson, & Pearson, 1988).

If there are ability differences in learning from context, this suggests that effort should be made to specifically train students in strategies to do this more efficiently. At present, such training does not appear to be particularly effective. Some studies have found inconsistent effects due to context clue training (e.g. Kranzer & Pikulski, 1988; Sternberg, 1987). Where such training has been found effective (e.g. Herman & Weaver, 1988), it seems to work by making students more aware of unknown while reading and more motivated to infer their meanings. As discussed earlier, Konopak et al (1987) found that children learn more words from context if direct to do so.

We know that children learn most of the words they learn from exposure

in context. We also know that vocabulary knowledge correlates strongly with reading comprehension skill and to increase a child's vocabulary knowledge is to improve comprehension, over the long term (Stahl & Fairbanks, 1986). It is important that we know more about the conditions which promote learning from context, so that we can directly improve all children's comprehension abilities.

References

Anderson, R.C., Wilson, P.T., & Fielding, L. (1988) Growth in reading and how children spend their time outside of school. Reading Research Quarterly, 23, 285-303.

Dale, E. & O'Rourke, J.P. (1976). The living word vocabulary. Chicago: Field Enterprises.

De Santi, R.J. (1986). The De Santi Cloze Reading Inventory, Boston: Allyn & Bacon.

Elshout-Mohr, M. & van Daalen-Kapteijns, M.M. (1987) Cognitive processes in learning word meanings. In M.G. McKeown & M.E. Curtis (eds.) The nature of vocabulary acquisition (pp. 53-71). Hillsdale, NJ: Erlbaum.

Graves, M.F. & Slater, W.H. (1987, April). The development of reading vocabularies in children from three social, economic, and linguistic settings. Paper presented at annual meeting, American Educational Research Association, Washington, DC.

Herman, P.A., Anderson, R.C., Pearson, P.D., & Nagy, W.E. (1987) Incidental acquisition of word meaning from expositions with varied text features. Reading Research Quarterly, 22, 263-284.

Herman, P.A. & Weaver, C.R. (1988, December). Contextual strategies for learning word meanings: Middle grade students look in, look out. Paper presented at annual meeting, National Reading Conference, Tucson, AZ.

Jenkins, J.R., Stein, M.L., & Wysocki, K. (1984). Learning vocabulary through reading. American Educational Research Journal, 21, 767-788.

Kintsch, W. & Yarbrough, J.C. (1982). Role of rhetorical structure in text comprehension. Journal of Educational Psychology, 74, 828-834.

Konopak, B.C., Sheard, C., Longman, D., Lyman, B., Slaton, E., Atkinson, R., & Thames, D. (1987). Incidental versus intentional word learning

from context. Reading Psychology, 8, 7-21.

Kranzer, K.G. & Pikulski, J.J. (1988, December). The effects of instruction in incidental word learning and ability to derive word meaning. Paper presented at annual meeting, National Reading Conference, Tucson, AZ.

McKeown, M.G. (1985). The acquisition of word meaning from context by children of high and low ability. Reading Research Quarterly, 20, 482-496.

Nagy, W.E. & Anderson, R.C. (1984). How many words are there in printed school English? Reading Research Quarterly, 19, 304-342.

Nagy, W.E., Anderson, R.C., & Herman, P.A. (1987). Learning word meanings from context during normal reading. American Educational Research Journal, 24, 237-270.

Nagy, W.E., Herman, P.A., & Anderson, R.C. (1985) Learning words from context. Reading Research Quarterly, 20, 233-253.

Owen, R.C. (1972). Inquiring about cultures. New York, NY: Holt, Rinehart, & Winston.

Stahl, S.A. & Fairbanks, M.M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. Review of Educational Research, 56, 72-110.

Stahl, S.A. & Jacobson, M.J. (1986). Vocabulary difficulty, prior knowledge, and text comprehension. Journal of Reading Behavior, 18, 309-323.

Stahl, S.A., Jacobson, M.J., Davis, C.E., & Davis, R.L. (1989). Prior knowledge and difficult vocabulary in the comprehension of unfamiliar text. Reading Research Quarterly, 24,

Stanovich, K.E. (1986). Matthew effects in reading: Some consequences of

individual differences in the acquisition of literacy. Reading Research Quarterly, 21, 360-407.

Sternberg, R.J. (1987) Most vocabulary is learned from context. In M.G. McKeown & M.E. Curtis (eds.) The nature of vocabulary acquisition (pp. 89-106). Hillsdale, NJ: Erlbaum.

Wilkinson, I.A.G., Anderson, R.C., & Pearson, P.D. (1988, April). Silent reading: A best-evidence synthesis. Paper presented at annual meeting, American Educational Research Association, New Orleans, LA.

APPENDIX: Multiple Choice Test

1. An envoy is a
   a. chef.
   b. messenger.
   c. warrior.
   d. someone mean to fool people.

2. To reiterate means to
   a. hit back.
   b. repel.
   c. repeat.
   d. explain again.

3. A fete is a
   a. feast or party.
   b. kind of cheese.
   c. something that will happen to you.
   d. boxing match.

4. To slay is to
   a. relax.
   b. pull something.
   c. laugh.
   d. kill someone.

5. A javelin is
   a. a spear-like weapon.
   b. a heavy ball for throwing.
   c. used for transportation.
   d. a small animal native to the Amazon.

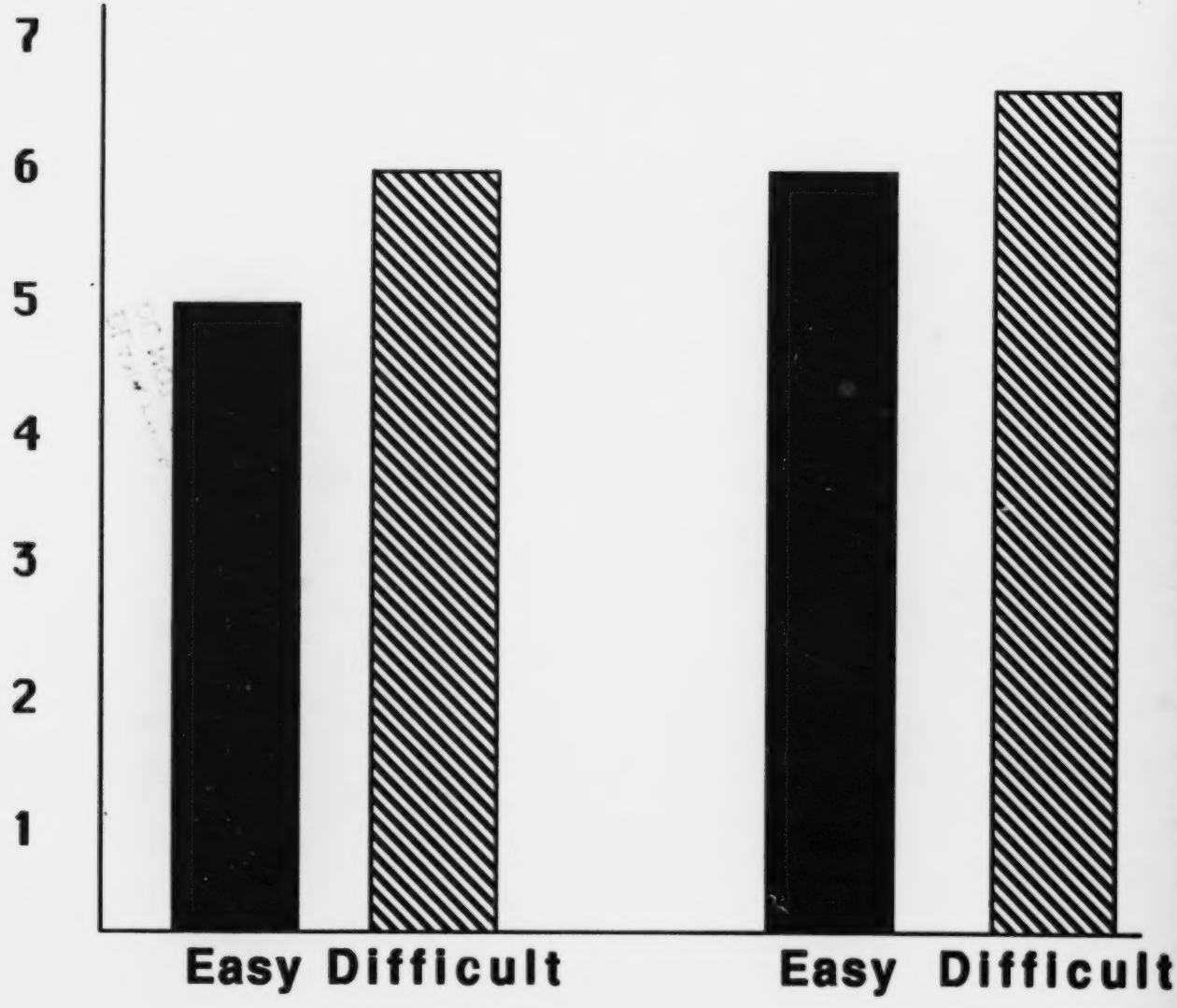
6. To trek is to
   a. journey.
   b. step.
   c. fall down.
   d. make a mistake.

7. Bartering means
   a. drinking.
   b. arguing.
   c. chasing.
   d. trading.

8. An adversary is
   a. a message.
   b. an enemy.
   c. a type of weapon
   d. a war chant.

9. Dispatch means
   a. to take off.
   b. to send.
   c. to chase after.
   d. to hide from.

10. To speculate is to
   a. think about.
   b. brew a drink.
   c. look at closely.
   d. kill a person.


7
6
5
4
3
2
1
Easy Difficult
Easy Difficult